

Notice of Allowability

Application No.

10/067,486

Applicant(s)

TAYANAKA, HIROSHI

Examiner

Khanh Duong

Art Unit

2822

AW

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to the amendment filed December 31, 2003.
2. ☒ The allowed claim(s) is/are 19-21, 23, 24, 26-29 and 31-33.
3. ☒ The drawings filed on 04 February 2002 are accepted by the Examiner.
4. ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 - a) ☒ All b) ☐ Some* c) ☐ None of the:
 1. ☐ Certified copies of the priority documents have been received.
 2. ☒ Certified copies of the priority documents have been received in Application No. 09/217,907.
 3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

* Certified copies not received: _____.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.

THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

5. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
 6. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
 - (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
 - 1) ☐ hereto or 2) ☐ to Paper No./Mail Date _____.
 - (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date _____.
- Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).
7. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

1. ☐ Notice of References Cited (PTO-892)
2. ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3. ☐ Information Disclosure Statements (PTO-1449 or PTO/SB/08), Paper No./Mail Date _____
4. ☐ Examiner's Comment Regarding Requirement for Deposit of Biological Material
5. ☐ Notice of Informal Patent Application (PTO-152)
6. ☐ Interview Summary (PTO-413), Paper No./Mail Date _____
7. ☒ Examiner's Amendment/Comment
8. ☒ Examiner's Statement of Reasons for Allowance
9. ☐ Other _____


AMIR ZARABIAN
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2800

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DETAILED ACTION

Response to Amendment

This Office Action is in response to the amendment filed December 31, 2003.

Accordingly, claims 18, 22, 25 and 30 were canceled, and claims 19, 23, 26, 28, 29 and 31 were amended.

Currently, claims 19-21, 23, 24, 26-28 and 31-33 are pending in the application.

Examiner's Amendment

An examiner's amendment to the record appears below. Should the changes and/or additions be unacceptable to applicant, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it MUST be submitted no later than the payment of the issue fee.

The application has been amended as follows:

In the Title:

Please amend the title as follows: METHOD FOR MAKING A SEMICONDUCTOR SUBSTRATE COMPRISING A VARIANT POROUS LAYER.

Allowable Subject Matter

Claims 19-21, 23, 24, 26-29 and 31-33 are allowed.

The following is an examiner's statement of reasons for allowance: none of the prior art of record fairly shows or suggests all the process limitations as claimed. Specifically,

Re claim 19, none of the prior art of record discloses, in addition to other process steps or elements, the steps of: *forming a variant impurity layer with an impurity concentration varying in a depth direction on one surface of a supporting substrate by means other than anodic*

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oxidation, wherein a variant impurity layer including at least two sublayers having different impurity concentrations is formed in the variant layer forming step; and forming a porous layer by providing pores in the variant impurity layer by anodic oxidation so that a porosity in the porous layer varies in the depth direction, wherein a porous layer including at least two sublayers having different porosities is formed in the porous layer forming step.

Re claim 23, none of the prior art of record discloses, in addition to other process steps or elements, the steps of: *forming a variant impurity layer with an impurity concentration varying in a depth direction on one surface of a supporting substrate by means other than anodic oxidation, wherein, in said variant layer forming step, a low-impurity sublayer comprising a semiconductor having a low impurity concentration is formed and a high-impurity sublayer comprising a semiconductor having a high impurity concentration is formed on the surface, away from the supporting substrate, of the low-impurity sublayer; and forming a porous layer by providing pores in the variant impurity layer by anodic oxidation so that a porosity in the porous layer varies in the depth direction.*

Re claims 26, 29 and 32, none of the prior art of record discloses, in addition to other process steps or elements, the steps of: *forming a variant impurity layer with an impurity concentration varying in a depth direction on one surface of a supporting substrate by means other than anodic oxidation; forming a porous layer by providing pores in the variant impurity layer by anodic oxidation so that a porosity in the porous layer varies in the depth direction.*

Re claims 31 and 33, none of the prior art of record discloses, in addition to other process steps or elements, the steps of: *forming a high-impurity layer comprising a semiconductor having an impurity concentration of $1 \times 10^{18} \text{ cm}^{-3}$ or more on one surface of a supporting substrate*

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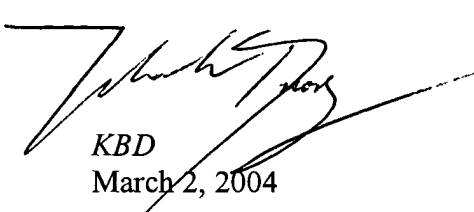
by means other than anodic oxidation; and forming pores in the high-impurity layer by anodic oxidation to form a porous layer having different porosities in a depth direction.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Khanh Duong whose telephone number is (571) 272-1836. The examiner can normally be reached on Monday - Friday (9:00 AM - 6:00 PM).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Amir Zarabian, can be reached on (571) 272-1852. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 305-3431 for regular communications and (703) 308-7722 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0956.


KBD
March 2, 2004


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